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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

FOULADI et al.

Atty. Ref.: 723-974

Serial No. 09/726,220

Group: 2671

Filed: November 28, 2000

Examiner:

For: GRAPHICS PROCESSING SYSTEM WITH ENHANCED
MEMORY CONTROLLER

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May 22, 2003

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Under 37 C.F.R. §§ 1.56 and 1.97, the applicant directs the attention of the Patent and Trademark Office to the items listed on the attached forms PTO-1449. These items were cited in copending commonly-assigned related patent applications as indicated in the appendix and not yet of record in this case.¹ The Examiner is requested to cite and consider these items in this case.

Applicant is attaching copies of all items other than U.S. patents. The U.S. patents are readily available to the Examiner; applicant will submit a copy upon request.

Should the examiner need anything further to consider these items, please contact the undersigned at the telephone number listed below.

Applicants have listed publication dates on the attached PTO-1449 based on information presently available to the undersigned. However, the listed publication dates should not be construed as an admission that the information was actually published on the date indicated.

Applicants reserve the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may

not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This statement should not be construed as a representation that a search has been made, or that information more material to the examination of the present patent application does not exist. The Examiner is specifically requested not to rely solely on the material submitted herewith.

In the event a first Office Action has already been mailed, please treat this paper as a submission under 37 C.F.R. § 1.97(c) and charge Deposit Account No. 14-1140 for the fee required by 37 C.F.R. § 1.17(p). The U.S. Patent and Trademark Office is authorized to charge any fee which was asserted to have been filed or which should have been filed and to credit any overpayment, to that same Deposit Account No. 14-1140.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: 

Michael J. Shea
Reg. No. 34,725

MJS::bld
1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

¹ The identification of the co-pending U.S. Patent Applications in the appendix is not to be construed as a waiver of secrecy as to those applications now or upon issuance of this application as a patent.

APPENDIX

The items cited on the attached form PTO-1449 is of record in the co-pending related commonly-assigned patent applications as indicated below:

**I. Application No. 09/465,754 filed December 17, 1999 (atty. dkt. no. 723-799)
entitled “Vertex Cache For 3D Computer Graphics”:**

WO/93/04429	PCT
4,491,836	Collmeyer et al.
4,653,012	Duffy et al.
4,695,943	Keeley et al.
4,710,876	Cline et al.
4,768,148	Keeley et al.
4,785,395	Keeley
4,790,025	Inoue et al.
4,812,988	Duthuit et al.
4,829,452	Kang et al.
4,833,601	Barlow et al.
4,965,751	Thayer et al.
4,975,977	Kurosu et al.
5,056,044	Frederickson et al.
5,086,495	Gray et al.
5,163,126	Einkauf et al.
5,179,638	Dawson et al.
5,353,424	Partovi et al.
5,448,689	Matsuo et al.
5,657,045	Katsura et al.
5,657,443	Krech, Jr.
5,659,673	Nonoshita
5,726,947	Yamazaki et al.
5,740,406	Rosenthal et al.
5,745,125	Deering et al.
5,748,986	Butterfield et al.
5,751,930	Katsura et al.
5,754,191	Mills et al.
5,801,720	Norrod et al.
5,821,940	Morgan et al.

5,821,940	Morgan et al
5,822,516	Krech, Jr.
5,838,334	Dye
5,886,701	Chauvin et al.
5,887,155	Laidig
5,940,089	Dilliplane
5,949,421	Ogletree et al.
5,995,120	Dye
6,088,701	Whaley et al.
6,226,713 B1	Mehrotra
6,292,194 B1	Powll, III
6,408,362 B1	Arimilli et al.
6,426,747	Hoppe et al.
6,459,429	Deering

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White paper, Rogers, Douglas H., "Optimizing Direct3D for the GeForce 256" (1/3/2000)

Hook, Brian, "An Incomplete Guide to Programming DirectDraw and Direct3D Immediate Mode (Release 0.46)," printed from web site: www.wksoftware.com, 42 pages

Thompson, Tom, "Must-See 3-D Engines," BYTE MAGAZINE, printed from web site www.byte.com, 10 pages (June 1996)

Thompson, Nigel, "Rendering with Immediate Mode," Microsoft Interactive Developer Column: Fun and Games, printed from web site msdn.microsoft.com, 8 pages (March 97)

"HOWTO: Animate Textures in Direct3D Immediate Mode," printed from web site support.microsoft.com, 3 pages (last reviewed 12/15/2000)

INFO: Rendering a Triangle Using an Execute Buffer," printed from web site support.microsoft.com, 6 pages (last reviewed 10/20/2000)

U.S. application Serial No. 09/337,293, filed 6/21/1999, "Multi-Format Vertex Data Processing Apparatus and Method

Datasheet, SGS-Thomson Microelectronics, nVIDIA™, RIVA 128™ 128-Bit 3D Multimedia Accelerator (10/1997)

Product Presentation, "RIVA128™ Leadership 3D Acceleration," 2 pages

Hoppe, Hugues, "Optimization of Mesh Locality for Transparent Vertex Caching," PROCEEDINGS OF SIGGRAPH, pages 269-276 (August 8-13, 1999)

II. Application No. 09/726,223 filed November 28, 2000 (atty. dkt. no. 723-751) entitled “Z Value Clamping In Near-Z Range To Maximize Precision Of Visually Important Z Components And To Avoid Near-Z Clipping In A Graphics Rendering System”:

4,888,712	BARKANS et al.
4,907,174	PRIEM
5,819,017	Akeley et al.
5,856,829	GRAY, III et al.
5,923,332	IZAWA
5,926,182	MENON et al.
5,982,376	ABE et al.
5,986,659	GALLERY et al.
6,046,746	DEERING
6,052,129	FOWLER et al.
6,144,387	LIU et al.
6,157,387	KOTANI
6,285,779	Lapidous et al.

III. Application No. 09/722,419 filed November 28, 2000 (atty. dkt. no. 723-958) entitled “Graphics Pipeline Token Synchronization”:

4,989,138	Radochonski
5,345,541	Kelley et al
5,467,459	Alexander et al.
5,487,146	Guttag et al.
5,768,629	Wise et al.
5,828,907	Wise et al.
5,835,792	Wise et al.
5,872,902	Kuchkuda et al.
5,982,390	Stoneking et al.
6,046,752	Kirkland et al.
6,252,610	Hussain
6,476,808	Kuo et al.

IV. Application No. 09/722,382 filed November 28, 2000 (atty. dkt. no. 723-961) entitled “Method And Apparatus For Direct and Indirect Texture Processing In A Graphics System”:

4,692,880	MERZ et al.
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4,935,879	UEDA
5,003,496	HUNT, Jr. et al.
5,422,997	NAGASHIMA
5,469,535	JARVIS et al.
5,495,563	WINSER
5,548,709	HANNAH et al.
5,582,451	COX et al.
5,586,234	SAKURABA et al.
5,664,162	DYE
5,696,892	REDMANN et al.
5,706,481	HANNAH et al.
5,726,689	NEGISHI et al.
5,734,386	COSMAN
5,745,118	ALCORN et al.
5,751,292	EMMOT
5,764,237	KANEKO
5,777,623	SMALL
5,831,625	RICH et al.
5,831,640	WANG et al.
5,835,096	BALDWIN
5,861,888	DEMPSEY
5,877,770	HANAOKA
5,892,517	RICH
5,926,647	ADAMS et al.
5,945,997	ZHAO et al.
5,963,220	LEE et al.
5,987,567	RIVARD et al.
5,999,198	HORAN et al.
6,002,407	FADDEN
6,011,565	KUO et al.
6,040,844	YAMAGUCHI et al.
6,046,747	SAUNDERS et al.
6,052,126	SAKURABA et al.
6,057,849	HAUBNER et al.
6,057,851	LUKEN et al.
6,057,861	LEE et al.
6,353,438	VAN HOOK

Whitepapers: "Texture Addressing," Sim Dietrich, January 6, 2000, www.nvidia.com

V. Application No. 09/722,367 filed November 28, 2000 (atty. dkt. no. 723-968)
entitled "Recirculating Shade Tree Blender For A Graphics System":

4,586,038 Sims et al.
5,278,948 Luken, Jr.
5,561,752 Jevans
5,678,037 Osugi et al.
5,867,166 Myhrvold et al.
5,949,428 Toelle et al.
5,999,189 Kajiya et al.
6,016,151 Lin
6,043,821 Sprague et al.
6,236,413 Gossett et al.
6,331,856 Van Hook et al.

RenderMan Interface Version 3.2 (7/2000)

The RenderMan Interface Version 3.1," (September 1989)

"Renderman Artist Tools, PhotoRealistic RenderMan Tutorial," Pixar (01/1996)

Web site materials, "Renderman Artist Tools, PhotoRealistic RenderMan 3.8 User's Manual," Pixar,

NVIDIA.com, technical presentation, "AGDC Per-Pixel Shading" (11/15/2000)

NVIDIA.com, technical presentation, "Introduction to DX8 Pixel Shaders (11/10/2000)

NVIDIA.com, technical presentation, "Advanced Pixel Shader Details" (11/10/2000)

"Developer's Lair, Multitexturing with the ATI Rage Pro," (7 pages) from ati.com web site (2000)

VI. Application No. 09/726,218 filed November 28, 2000 (atty. dkt. no. 723-960)
entitled "Method And Apparatus For Efficient Generation Of Texture Coordinate
Displacements For Implementing Emboss-Style Bump Mapping In A Graphics
Rendering System":

5,900,881 IKEDO
5,880,736 PEERCY et al.
5,808,619 CHOI et al.
4,808,988 BURKE et al.

6,014,144	NELSON et al.
5,224,208	MILLER, JR. et al.
6,078,334	HANAOKA et al.
5,561,746	MURATA et al.
5,659,671	TANNENBAUM et al.
4,974,177	NISHIGUCHI
6,081,274	SHIRAI SHI
6,031,542	WITTIG
5,621,867	MURATA et al.

GDC 2000: Advanced OpenGL Game Development, “A Practical and Robust Bump-mapping Technique for Today’s GPUs,” by Mark Kilgard, July 5, 2000, www.nvidia.com

Technical Presentations: “Texture Space Bump Mapping,” Sim Dietrich, November 10, 2000, www.nvidia.com

VII. Application No. 09/722,381 filed November 28, 2000 (atty. dkt. no. 723-962) entitled “Method And Apparatus For Environment-Mapped Bump-Mapping In A Graphics System”:

0 637 813 A2	EUROPEAN
4,615,013	YAN et al.
5,544,292	WINSER
5,563,989	BILLYARD
5,809,219	PEARCE et al.
5,870,102	TAROLLI et al.
5,923,334	LUKEN
5,956,043	JENSEN
6,049,337	VAN OVERVELD
6,052,127	VASWANI et al.
6,078,333	WITTIG et al.
6,191,794	PRIEM et al.

VIII. Application No. 09/726,216 filed November 28, 2000 (atty. dkt. no. 723-967) entitled “Achromatic Lighting in a Graphics System and Method”:

4,275,413	Sakamoto et al.
5,016,183	Shyong
5,097,427	Lathrop et al.

5,361,386	Watkins et al.
5,467,438	Nishio et al.
5,473,736	Young
5,495,563	Winser, Paul A.
5,504,499	Horie et al.
5,557,712	Guay
5,566,285	Okada
5,649,082	Burns
5,687,304	Kiss, Kenneth W.
5,740,343	Tarolli et al.
5,943,058	Nagy
5,956,042	Tucker et al.
6,023,261	Ugajin
6,232,981	Gossett, Carroll Philip
6,239,810	Van Hook et al.
6,417,858	Bosch et al.

White paper, Dietrich, Sim, "Cartoon Rendering and Advanced Texture Features of the GeForce 256 Texture Matrix, Projective Textures, Cube Maps, Texture Coordinate Generation and DOTPRODUCT3 Texture Blending" (12/16/1999)

IX. Application No. 09/726,226 filed November 28, 2000 (atty. dkt. no. 723-964) entitled "Method And Apparatus For Anti-Aliasing In A Graphics System":

4,897,806	COOK et al.
5,239,624	COOK et al.
5,394,516	WINSER
5,600,763	GREENE et al.
5,651,104	COSMAN
5,764,228	BALDWIN
5,818,456	COSMAN et al.
5,859,645	LATHAM
5,877,771	DREBIN et al.
5,943,060	COSMAN et al.
5,949,428	TOELLE et al.
6,028,608	JENKINS
6,038,031	MURPHY

6,469,707 B1 Douglas Voorhies
6,496,187 B1 Michael Deering et al.

Whitepaper: Implementing Fog in Direct3D, January 3, 2000, www.nvidia.com

Akeley, Kurt, "Reality Engine Graphics", 1993, Silicon Graphics Computer Systems, pp. 109-116.

X. Application No. 09/722,380 filed November 28, 2000 (atty. dkt. no. 723-957) entitled "Graphics System With Embedded Frame Buffer Having Re-configurable Pixel Formats":

5,018,076 JOHARY et al.
5,241,658 MASTERSON et al.
5,307,450 Grossman
5,543,824 PRIEM et al.
5,559,954 SAKODA et al
5,650,955 PUAR et al.
5,657,478 RECKER et al.
5,694,143 Fielder et al.
5,703,806 PUAR et al.
5,742,788 PRIEM et al.
5,890,190 Rutman
5,914,729 LIPPINCOTT
5,933,154 HOWARD et al.
6,041,010 PUAR et al.
6,075,543 AKELEY
6,215,497 Leung
6,356,497 PUAR et al.
6,476,822 Burbank

Videum Conference Pro (PCI) Specification, product of Winnov (Winnov), published 7/21/1999

XI. Application No. 09/585,329 filed June 2, 2000 entitled "Variable Bit Field Color Encoding" (atty. dkt. no. 723-749):

4,918,625 Yan
5,416,606 Katayama et al.

5,606,650	Kelley et al.
5,767,858	Kawase et al.
5,805,175	Priem
5,880,737	Griffen et al.
5,886,705	Lentz
5,894,300	Takizawa
5,914,725	McInnis et al.
5,986,663	Wilde
6,005,583	Morrison
6,005,584	Kitamura et al.
6,016,150	Lengyel et al.
6,054,993	Devic et al.
6,339,428 B1	Fowler et al.

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ZDNet Reviews, from PC Magazine, "Screen Shot of Alpha-channel Transparency," January 15, 1999,
[wysiwyg://16/http://www4.zdnet.com...ies/reviews/0,4161,2188286,00.html](http://www4.zdnet.com...ies/reviews/0,4161,2188286,00.html)

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<http://toolbox.sgi.com/TasteOfDT/d...penGL/advanced98/notes/node41.html>, June 11, 1998

10.2 Alpha Blending,
<http://www.sgi.com/software/opengl/advanced98/notes/node146.html>

10.3 Sorting, <http://www.sgi.com/software/opengl/advanced98/notes/node147.html>

10.4 Using the Alpha Function,
<http://www.sgi.com/software/opengl/advanced98/notes/node148.html>

Winner, Stephanie, et al., "Hardware Accelerated Rendering Of Antialiasing Using A Modified A-buffer Algorithm," Computer Graphics Proceedings, Annual Conference Series, 1997, pp 307-316

**XII. Application No. 09/726,212 filed November 28, 2000 (atty. dkt. no. 723-956)
entitled "Method And Apparatus For Dynamically Reconfiguring The Order Of
Hidden Surface Processing Based On Rendering Mode":**

5,144,291	Nishizawa
5,268,995	Diefendorff et al.
6,052,125	Gardiner et al.

6,111,584 Murphy, Nicholas J.N.
6,144,365 Young et al.
6,166,748 Van Hook et al.
6,172,678 B1 Shiraishi
6,204,851B1 Netschke et al.

XIII. Application No. 09/726,212 filed November 28, 2000 (atty. dkt. no. 723-973) entitled “Method And Apparatus For Providing Non-Photorealistic Cartoon Outlining Within A Graphics System”:

5,091,967 Ohsawa
5,666,439 Ishida et al
5,684,941 Dye
5,757,382 Lee
5,933,529 Kim
5,940,538 Spiegel et al
6,021,417 Massarksy
6,026,182 Lee et al
6,038,348 Carley
6,061,462 Tostevin et al
6,088,487 Kurashige

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Peter J. Kovach, INSIDE DIRECT 3D, “Alpha Testing,” pp 289-291 (1999)

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<http://www.digimotion.co.uk/cartoonreyes.htm>

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Haeberli, Paul et al., “Texture Mapping as a Fundamental Drawing Primitive,” Proceedings of the Fourth Eurographics Workshop on Rendering, 11pages, Paris, France (June 1993)

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Feth, Bill, "Non-Photorealistic Rendering," wif3@cornell.edu, CS490 – Bruce Land, 5 pages (Spring 1998)

Elber, Gershon, "Line Art Illustrations of Parametric and Implicit Forms," IEEE Transactions on Visualization and Computer Graphics, Vol. 4, No. 1, January-March 1998

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Reynolds, Craig, "Stylized Depiction in Computer Graphics, Non-Photorealistic, Painterly and 'Toon Rendering," an annotated survey of online resources, 13 pages, last update May 30, 2000, <http://www.red.com/cwr/painterly.html>

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<http://www.pixar.com/products/renderman/toolkit/AppNotes/appnote.24.html>

Decaudin, Philippe, "Cartoon-Looking Rendering of 3D Scenes," Syntim Project Inria, 6 pages , <http://www-syntim.inria.fr/syntim/recherche/decaudin/cartoon-eng.html>

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Digimation Inc., "The Incredible Comicshop," info sheet, 2 pages, http://www.digimation.com/asp/product/asp?product_id=33

Softimage/3D Full Support, "Toon Assistant," 1998 Avid Technology, Inc., 1 page, http://www.softimage.com/3dsupport/techn...uments/3.8/features3.8/rel_notes.56.html

Cambridge Animo – Scene III, info sheet, Cambridge Animation Systems, 2 pages, <http://www.cam-ani.co.uk/casweb/products/software/SceneIII.htm>

Mulligan, Vikram, "Toon," info sheet, 2 pages, <http://digitalcarversguild.com/products/toon/toon.thml>

Toony Shaders, "Dang I'm tired of photorealism," 4 pages, <http://www.visi.com/~mcdonald/toony.html>

"Cartoon Shading, Using Shading Mapping," 1 page, <http://www.goat.com/alias/shaders.html#toonshad>

web site information, CartoonReyes, <http://www.zentertainment.com/zentropy/review/cartoonreyes.html>

VIDI Presenter 3D Repository, "Shaders." 2 pages,
<http://www.webnation.com/vidirep/panels/renderman/shaders/toon.phtml>

XIV. Application No. 09/726,225 filed November 28, 2000 (atty. dkt. no. 723-954)
entitled "Method And Apparatus For Providing Improved Fog Effects In A
Graphics System":

4,463,380	HOOKS, Jr.
5,268,996	STEINER et al.
5,357,579	BUCHNER et al.
5,363,475	BAKER et al.
5,412,796	OLIVE
5,415,549	LOGG
5,432,895	MYERS
5,535,374	OLIVE
5,573,402	GRAY
5,616,031	LOGG
5,724,561	TAROLLI et al.
5,977,984	OMORI
5,990,903	DONOVAN
6,005,582	GABRIEL et al.
6,064,392	ROHNER
6,268,861 B1	Sanz-Pastor et al.
6,342,892 B1	Van Hook et al.
6,437,781 B1	Tucker et al.

XV. Application No. 09/722,664 filed November 28, 2000 (atty. dkt. no. 723-969)
entitled "Controller Interface For A Graphics System":

5,593,350	BOUTON et al.
5,607,157	NAGASHIMA
5,628,686	SVANCAREK et al.
5,638,535	Rosenthal et al.
5,714,981	SCOTT-JACKSON et al.
5,791,994	HIRANO et al.
5,892,974	KOIZUMI et al.
5,958,020	EVOY et al.
6,007,428	NISHIUMI et al.
6,022,274	TAKEDA et al.

6,070,204 Poisner, David
6,078,311 Pelkey, Michael H.
6,155,926 MIYAMOTO et al.
6,200,253 NISHIUMI et al.
6,264,558 NISHIUMI et al.

XVI. Application No. 09/726,221 filed November 28, 2000 (atty. dkt. no. 723-955)
entitled “Method And Apparatus For Texture Tiling In A Graphics System”:

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5,490,240 FORAN et al.
5,760,783 MIGDAL et al.
5,828,382 WILDE
5,831,624 TAROLLI et al.
5,844,576 WILDE et al.
6,002,410 BATTLE
6,049,338 ANDERSON et al.
6,104,415 GOSSETT
6,466,223 B1 Dorbie et al.

XVII. Application No. 09/722,378 filed November 28, 2000 (atty. dkt. no. 723-965)
entitled “Z-Texturing”:

4,855,934 Robinson
5,751,291 Olsen et al
5,914,721 Lim
5,949,423 Olsen
5,977,979 Clough et al
6,037,948 Liepa
6,057,847 Jenkins
6,088,035 Sudarsky et al
6,094,200 Olsen et al
6,111,582 Jenkins
6,115,049 Winner et al
6,215,496 B1 Szeliski et al

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Proceedings, Annual Conference Series, pp. 231-242 (1998)

XVIII. Application No. 09/723,336 filed November 28, 2000 entitled “Application Program Interface for a Graphics System” (atty. dkt. no. 723-976):

9-330230	JAPAN
5,404,445	Matsumoto
5,432,900	Rhodes et al
5,438,663	Matsumoto et al
5,751,295	Becklund et al
5,861,893	Strugess, Jay J.
5,870,587	DANFORTH et al.
5,920,876	UNGAR et al.
5,936,641	Jain et al
5,995,121	Alcokrn et al
6,052,133	Kang
6,057,863	Olarig
6,151,602	HEJLSBERG et al.
6,177,944	FOWLER et al.
6,275,235	Morgan, III, David L.

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4,357,624	GREENBERG
4,817,175	TENENBAUM et al.
5,062,057	BLACKEN et al.
5,204,944	WOLBERG et al.
5,315,692	HANSEN et al.
5,461,712	CHELSTOWSKI et al.
5,506,604	NALLY et al.
5,608,864	BINDLISH et al.
5,644,364	KURTZE et al.
5,691,746	SHYU
5,801,711	KOSS et al.

5,808,630	PANNELL
5,815,165	BLIXT
5,828,383	MAY et al.
5,877,741	CHEE et al.
5,909,225	SCHINNERER et al.
5,912,676	MALLADI et al.
5,936,683	LIN
6,020,931	BILBREY et al.
6,040,843	MONROE et al.
6,043,804	GREENE
6,067,098	DYE
6,097,435	STANGER et al.
6,097,437	HWANG
6,115,047	DEERING

- XX. Application No.09/722,665 filed November 28, 2000 (atty. dkt. no. 723-970)
entitled “Method and Apparatus for Accessing Shared Resources”:

5,682,522	HUANG et al.
5,706,482	MATSUSHIMA et al.
5,740,383	NALLY et al.
5,781,927	WU et al.
5,903,283	SELWAN et al.
5,959,640	RUDIN et al.
5,986,677	JONES et al.
6,008,820	Chauvin et al.
6,035,360	Doidge et al
6,057,862	MARGULIS
6,078,338	HORAN et al.
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entitled “Low Cost Graphics System With Stitching Hardware Support For
Skeletal Animation”:

4,600,919	Stern
5,475,803	Stearns et al
5,579,456	Cosman, Michael A.
5,748,199	Palm
5,850,229	Edelsbrunner et al.
5,883,638	Rouet et al.
5,909,218	Naka et al.
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5,043,922	Matsumoto
5,255,353	Itoh
5,377,313	Scheibl
5,402,532	Epstein et al.
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5,742,749	Foran et al.
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4,653,012	Duffy et al.
4,695,943	Keeley et al.
4,710,876	Cline et al.
4,768,148	Keeley et al.
4,785,395	Keeley
4,790,025	Inoue et al.
4,812,988	Duthuit et al.
4,829,452	Kang et al.
4,833,601	Barlow et al.
4,965,751	Thayer et al.
4,975,977	Kurosu et al.
5,056,044	Frederickson et al.
5,086,495	Gray et al.
5,163,126	Einkauf et al.
5,179,638	Dawson et al.
5,448,689	Matsuo et al.
5,657,045	Katsura et al.
5,657,443	Krech, Jr.
5,659,673	Nonoshita
5,740,406	Rosenthal et al.
5,748,986	Butterfield et al.
5,751,930	Katsura et al.
5,754,191	Mills et al.
5,821,940	Morgan et al.
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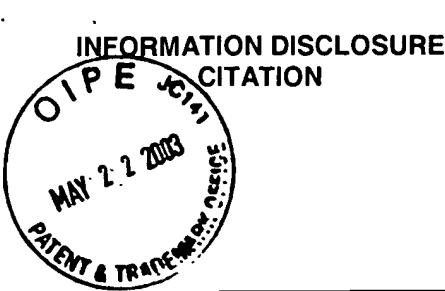
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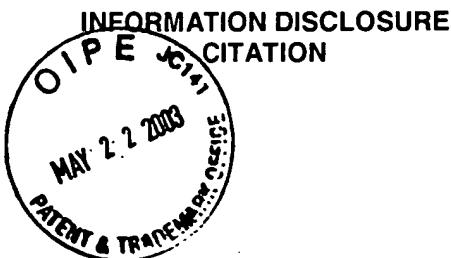
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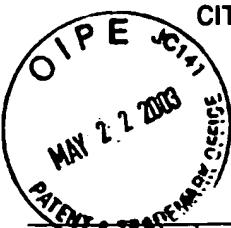
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